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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,453	09/05/2001	Ya-Chin King	015057-09162	4772

7590 06/19/2003
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EXAMINER

MANDALA, VICTOR A

ART UNIT PAPER NUMBER

2826

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/857,453

Applicant(s)

KING ET AL.

Examiner

Victor A Mandala Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.


- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. Applicant argues that the reasons for obviousness in the combination of Gardner et al. and Wristers et al. is not shown in Wristers et al.'s teachings. The examiner has considered the Applicant's arguments but finds them to be non-persuasive. Wristers et al. teachings that by adding oxygen ions into the surface of the substrate it would increase the oxidation rate, (Col. 2 lines 1-6). It is also found in the courts that the mere reversal of parts is also obvious. Gardner et al. discloses the claimed invention except for the increase oxidation rate from an oxygen ion implantation into the surface of the substrate, but instead the decrease in oxidation growth by the implantation of nitrogen ions. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use oxygen ions instead of nitrogen ions for the mere reversal from decreasing the oxidation growth to the increasing of the oxidation growth of the gate oxide in a cmos structure which in return would form two different gate oxide thicknesses depended upon the area which is doped with impurities, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167. The 35 U.S.C. 103(a) rejection on claims 16-20 stands as is.

2. Applicant has added claims 21-25 which will be further examined.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,054,374. Gardner et al. in view of U.S. Patent No. 5,930,620 Wristers et al.

3. Referring to claim 16, a semiconductor device having a gate oxide of multiple thickness, the semiconductor device comprising: a first gate oxide region having a first thickness, (Gardner et al. Col. 7 Lines 46-47 & Wristers et al. Col. 6 Lines 29-30), and a second gate oxide region having a second thickness, (Gardner et al. Col. 7 Lines 48-49 & Wristers et al. Col. 6 Lines 31-32), the second gate oxide region being oxygen-implanted oxide, (Wristers et al. Col. 6 Lines 26-27), the second thickness being greater than the first thickness, (Gardner et al. Col. 7 Lines 56-61 & Wristers et al. Col. 6 Lines 33-36).

Gardner et al. teaches all of the claimed matter in claim 1 except for the oxygen implants which is used for enhancing the growth of oxide, but a nitride implant is taught which is used to inhibit the growth of the oxide. Wristers et al. teaches using an oxygen implant to accelerate the growth of an oxide. It would have been obvious to combine the teachings of Gardner et al. with the teachings of Wristers et al. because it is well known in the art that impurities, such as nitrogen,

that are added to an oxide reduces the insulating properties and thermal tolerances causing a lower breakdown voltage of the oxide.

4. Referring to claim 17, a semiconductor device having a gate oxide of multiple thickness, wherein the first thickness is less than about 30Å, (Gardner et al. Col. 7 Lines 55-56).

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

5. Referring to claim 18, a semiconductor device having a gate oxide of multiple thickness, wherein the first thickness is less than the second by less than about 20Å, (Gardner et al. Col. 7 Lines 56-61).

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

6. Referring to claim 19, a semiconductor device having a gate oxide of multiple thickness, wherein the first gate oxide region is non-implanted oxide, (Col. 7 Lines 22-26).

7. Referring to claim 20, a semiconductor device having a gate oxide of multiple thickness, wherein the first gate oxide, (Gardner et al. Col. 7 Lines 46-47 & Wristers et al. Col. 6 Lines 29-

30), is oxygen implanted oxide, the implanted oxygen concentration being less than the implanted oxygen concentration, (Gardner et al. Col. 7 Lines 56-61), of the second gate oxide region, (Gardner et al. Col. 7 Lines 48-49 & Wristers et al. Col. 6 Lines 31-32).

8. Referring to claim 21, a semiconductor device having a gate oxide of multiple thickness for multiple transistors, the semiconductor device comprising: a first gate oxide region having a first thickness for a first transistor, (Gardner et al. Col. 7 Lines 46-47 & Wristers et al. Col. 6 Lines 29-30), and a second gate oxide region having a second thickness for a second transistor, (Gardner et al. Col. 7 Lines 48-49 & Wristers et al. Col. 6 Lines 31-32), the second gate oxide region including an oxygen-implanted oxide, (Wristers et al. Col. 6 Lines 26-27), under a non-implanted oxide, (See ** below), under a polysilicon gate, (Gardner et al. Col. 8 Lines 27-28), the second thickness being greater than the first thickness, (Gardner et al. Col. 7 Lines 56-61 & Wristers et al. Col. 6 Lines 33-36).

Gardner et al. teaches all of the claimed matter in claim 1 except for the oxygen implants which is used for enhancing the growth of oxide, but a nitride implant is taught which is used to inhibit the growth of the oxide. Wristers et al. teaches using an oxygen implant to accelerate the growth of an oxide. It would have been obvious to combine the teachings of Gardner et al. with the teachings of Wristers et al. because it is well known in the art that impurities, such as nitrogen, that are added to an oxide reduces the insulating properties and thermal tolerances causing a lower breakdown voltage of the oxide.

It is also found in the courts that the mere reversal of parts is also obvious. Gardner et al. discloses the claimed invention except for the increase oxidation rate from an oxygen ion implantation into the surface of the substrate, but instead the decrease in oxidation growth by the

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implantation of nitrogen ions. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use oxygen ions instead of nitrogen ions for the mere reversal from decreasing the oxidation growth to the increasing of the oxidation growth of the gate oxide in a cmos structure which in return would form two different gate oxide thicknesses depended upon the area which is doped with impurities, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

** It is obvious to one skilled in the art that with the formation of an oxide layer above an area of a substrate which is doped with oxygen ions that the lower portion of the oxide layer would be affected by the oxygen ions. The lower portion of the oxide layer would be the only area that the oxygen ions would migrate into when the oxide layer is being made by the process of thermal oxidation in an oxygen bearing ambient, (Gardner et al. Col. 6 Lines 20-24). Thus the upper portion of the oxide layer would not be affected by the oxygen ions implanted into the substrate and having the properties of a non-implanted oxide.

Initially, and with respect to claims 21-25, note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re Fitzgerald, 205 USPQ 594, 596 (CCPA); In re Marosi et al., 218 USPQ 289 (CAFC); and most recently, In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) all of which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product,

whether claimed in "product by process" claims or not. Note that Applicant has burden of proof in such cases as the above case law makes clear.

As to the grounds of rejection under section 103, see MPEP § 2113

9. Referring to claim 22, a semiconductor device having a gate oxide of multiple thickness, wherein the first thickness is less than about 30Å, (Gardner et al. Col. 7 Lines 55-56).

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

10. Referring to claim 23, a semiconductor device having a gate oxide of multiple thickness, wherein the first thickness is less than the second by less than about 20Å, (Gardner et al. Col. 7 Lines 56-61).

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

11. Referring to claim 24, a semiconductor device having a gate oxide of multiple thickness, wherein the first gate oxide region is non-implanted oxide, (Col. 7 Lines 22-26).

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12. Referring to claim 25, a semiconductor device having a gate oxide of multiple thickness, wherein the first gate oxide, (Gardner et al. Col. 7 Lines 46-47 & Wristers et al. Col. 6 Lines 29-30), is oxygen implanted oxide, the implanted oxygen concentration being less than the implanted oxygen concentration, (Gardner et al. Col. 7 Lines 56-61), of the second gate oxide region, (Gardner et al. Col. 7 Lines 48-49 & Wristers et al. Col. 6 Lines 31-32).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A Mandala Jr. whose telephone number is (703) 308-6560. The examiner can normally be reached on Monday through Thursday from 8am till 6pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

VAMJ
June 14, 2003